

For example, the same mechanisms that concentrate fine-grained sediments may also concentrate heavy metals, pesticides, and other toxic substances that are adsorbed onto the surfaces of the sediment particles. Preferential accumulation sites for organic-rich muds may thus be the accumulation sites for these toxic materials, at least until such time as they are released diagenetically or through resuspension. The shallow waters of Albemarle and Pamlico Sounds are of considerable interest in this regard since they generally have very limited exchange with the adjacent waters of the Atlantic, yet receive muddy sediments from deeply weathered piedmont soils of a large and rapidly expanding urban area to the west (Raleigh/Durham/Research Triangle Park).

Furthermore, sediments are important from a management standpoint because:

- 1) shoaling is more than just a hazard to navigation. It reduces the volume of the estuary, thereby increasing the impact of storm tides on coastal property; it alters the size and distribution of habitats available to important fish and shellfish; it can change over time the distribution of water-column turbidity, affecting, through light penetration, primary productivity.

- 2) decomposition of organic matter in the sediments represents an oxygen demand which, when combined with physical stratification, can lead to bottom-water anoxia and fish kills. Nutrient elements which are re-mineralized in the decomposition process make the sediments a nutrient bank for the water column; withdrawals may be gradual and continuous, due to diffusion, or abrupt, due to major sediment-resuspension events. Primary productivity in the water column responds to these nutrient inputs.

- 3) many sparingly soluble or particulate pollutants, both chemical and biological, are stored in the most mobile sediments, the mud fraction. Passage of these materials through the food web causes waters to be closed to shellfishing, and the primitive nature of our understanding of the effects of this pervasive contamination is a serious concern for the future.

Relative to its size and in terms of its sedimentary and geochemical processes, the Albemarle-Pamlico estuarine system is one of the least studied coastal/estuarine bodies of water in the United States. Although the literature, as shown in the following paragraphs, reflects considerable past research effort on sediment grain size and mineralogy, very little is known about sediment dynamics, flux of particulate material, or the role of sediments as a sink for pollutants and a source for regenerated nutrients. The clear connection between transport of sediments and transport of toxic and non-toxic substances on their surfaces is an important reason to begin integrating studies of particulates into estuarine studies of eutrophication, habitat loss, agricultural impact, and fisheries.